



RESEARCH NEED STATEMENT

Call for Projects 2015

Project Research Title: The Latent Classes in Joint Residence-Workplace Location Choice, and Travel Behavior Study

TDOT Sponsor Director: Tanisha Hall

List TDOT Research Team Lead: Chin-Cheng Chen

List TDOT Research Team Members: Jason McCoy, Jerry Yuknavage, Larry McGoogin, Robert Rock, Terry Gladden, Carlos McCloud

1. Define the problem or research requested. What is the goal/objective of the research?

Travel behavior and joint residence-workplace location choices are often interrelated. Households with similar characteristics can be grouped into different latent classes for the choice analyses. The research will determine the latent classes that can be applied to both Land-Use Models and the Travel Demand Models at the State and the TDOT-Region Level.

Objectives:

- To exam how household characteristics affect travel behavior, and joint residence-workplace location choicess for households in the state of Tennessee.
- Use best practices and statistically valid methods to group the households with similar characteristics into the same latent classes that can be used for land use modeling and travel demand modeling processes.
- Use best practice and statistically valid method to determine the best geographic boundaries to group the classes for the purpose of statewide level and TDOT-region level analyses.

2. Is this research a continuation of a past or present project?

☒ No ☐ Yes

If yes, provide current research project title, RES # and reason for the project continuation.

3. Describe anticipated benefits/expected deliverables.

- Literature Review on the how the latent-class approache is implemented in the transportation planning/modeling process.
- Statistical analysis report on how household characteristics affect the joint residence-workplace location choice, trip rates, and commute trip mode choice in the state of Tennessee.

- Define the latent classes by the state of Tennessee, TDOT Regions, and/or geography boundaries defined in the study. The development of the class should consider both joint residence-workplace location choice, and the travel behavior.

4. What is your timeline for completion of the research?

1 Year

5. List the anticipated tasks for this research.

The factors should be examined are listed below, additional variables can be defined in the study.

- Geography Effects -CBD/Urban/Rural Settings, TDOT Regions, Multi-Modal Accessibilities.
- Joint Residence-Workplace Choices - Land Use, Property Value/Renting Cost, Socio-Economic Data, Multi-Modal Accessibilities, Commute Time and Distance, Job Type, and Job Pay.
- Travel Behavior Choices - Trip Rates, Mode Choice for Commute

The following data will be provided if needed, additional data should be collected if needed

- Tennessee Roadway Information Management System Data (TRIMS)
- National Household Travel Survey and the Tennessee add-ons
- Household Travel Survey from Metropolitan Planning Organizations in Tennessee
- Census Data
- American Community Survey and Journey to Work Survey
- Tennessee County Parcel and Land Use Data
- Woods and Poole 2015
- Info Group Employment Data 2014
- Longitudinal Employer-Household Dynamics Data

6. Describe how the project results will be implemented?

The study will be presented to the Tennessee Model User Group members. A case study can then test the hypothesis of the effect of latent-class approach in both land use and travel demand models. Once the case study is completed, the result can be provide to the planning agencies in the state of Tennessee for the model updates at the state and the MPO level.

7. Will this study produce software, web page or other technology that will involve the Information Technology Division?

☒ No ☐ Yes, please describe:

8. Will training be provided to employees as a result of this research?

☒ No ☐ Yes, please describe:

9. Will this research involve equipment or materials purchase?

☒ No ☐ Yes, please describe:

10. Research must support the Long Range Transportation Plan Policy Recommendations **and/or** TDOT Operational Goals and/or Strategic Initiative. (*See attachments for additional information*)
Please indicate which categories the research will support:

Transportation Long Range Plan Policy Recommendations

- ☒ (A) Accessibility
- ☐ (B) Safety, Security, and Transportation Resilience
- ☐ (C) Coordination, Cooperation, and Consultation
- ☒ (D) Demographic and Employment Changes and Trends
- ☐ (E) Freight Logistics and Planning
- ☐ (F) Financial
- ☒ (G) Mobility
- ☒ (H) Travel Trends and System Performance

TDOT Operational Goals and/or Strategic Initiative

- ☐ (A) Deliver transportation projects on schedule and within budget
- ☒ (B) Maintain the state transportation system to protect the long term investment in our infrastructure assets
- ☒ (C) Operate and manage Tennessee's transportation system to provide a high level of safety and service to our customers and workers
- ☒ (D) Expanding mobility choices to maximize access
- ☐ (E) Dramatically change the paradigm for delivery of transportation products and service to improve the efficiency and effectiveness of Tennessee's transportation network

11. Please explain how the research supports the Long Range Transportation Plan Policy Recommendations **and/or** TDOT Operational Goals and/or Strategic Initiative selected above:

This research will provide a better understanding of household travel behavior and the potential impacts on the transportation system.

For additional information, please contact:
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